

Enhancing Retail Performance with Neuromarketing: An Applied Eye-Tracking Study on Private-Label Product Visibility

Cristina - Elena IORDACHE*

National University of Science and Technology Politehnica, Bucharest, Romania

**Corresponding author, ciordache1810@stud.fiir.upb.ro*

Adrian VULPE-GRIGORASI

National University of Science and Technology Politehnica, Bucharest, Romania

adrian.vulpe@upb.ro

Dan Andrei PANDURU

National University of Science and Technology Politehnica, Bucharest, Romania

Intersect Strategy Consulting, Bucharest, Romania

dan_andrei.panduru@upb.ro, andrei.panduru@incon.ro

Gheorghe MILITARU

National University of Science and Technology Politehnica, Bucharest, Romania

gheorghe.militaru@upb.ro

Abstract. *This study explores the impact of marketing interventions on visual attention to private-label products through a pre/post-experimental design with mobile eye-tracking (VPS19 glasses, 60 Hz) using a combination of quantitative and qualitative methods. Participants in the study attended two shopping sessions, a base line session and a session where they were exposed to information regarding the private-label brand. Velocity threshold algorithms processed eye movement data; interest scores based upon gaze behavior were created, along with synchronized video evaluation. No statistical differences were found in total engagement levels or visit times between conditions; however, there were large changes in spatial interaction patterns. After being exposed to the private-label brand information, visual attention to private-label product zones increased from 14% to 57 %, dwell time increased to 42 % and revisit rates reached 28 %. Therefore, these results clearly demonstrate that informational marketing has a positive effect on increasing both visual attention and engagement with private-label products without decreasing established product zones. These results provide evidence of how informational marketing can positively influence visual engagement with private-label products, assist retailers in making decisions regarding store layouts and communications strategies and provide empirical support for utilizing targeted informational interventions to promote visibility and consumer interest.*

Keywords: eye-tracking, neuromarketing, consumer interest, visual engagement, private-label products.

Introduction

The application of new technologies in the field of marketing research has significantly altered the ways in which we perceive and study consumer perception and decision-making in retail settings. There are two primary forms of research methodology, self-reports and observational studies, which have been widely used within the field of marketing research. Although both of these traditional research methodologies have provided considerable insight into the area of consumer behavior, they have some limitations due to their reliance on subjective reporting and the difficulties associated with assessing and interpreting the visual processes involved in consumer

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behavior. Furthermore, these research methodologies do not allow researchers to assess consumer behavior in real-world settings. To address the limitations associated with self-reporting and observational studies, marketing research has begun to utilize the field of neuroscience to better understand the consumer. As a result, the field of neuromarketing has developed, and the methodologies employed in neuromarketing include the use of physiological measures and, more specifically, the use of eye-tracking technologies (Ariely & Berns, 2010). Eye-tracking research offers several advantages over other methods of assessing consumer behavior. One key advantage of eye-tracking is that it is an objective, real-time method for quantifying visual attention and perception as visual perception is the most dominant form of sensory input in humans. In addition, eye-tracking also provides valuable insights into how consumers gaze patterns including fixation durations, saccadic movements, and dwelling times change when viewing products or make purchasing decisions in retail environments (Clement et al., 2015; Gidlöf et al., 2013). Evaluation of these visual and cognitive processes is essential for both marketers and retailers seeking to maximize product visibility and understand consumer behavior.

The focus of the current research is to assess the degree and impact of visual attention and interest in private-label products by consumers in an actual retail environment. An eye-tracking approach employing Viewpoint System's VPS19 mobile glasses will be utilized to determine whether product information influences visual patterns and overall product engagement. By conducting this research in a natural shopping environment, it is intended to increase ecological validity and contribute to a more accurate understanding of typical shopper behavior (Sorensen et al., 2017). The central research question of the current study is concerned with how marketing interventions affect consumer visual attention and interaction patterns with private label products in a retail environment.

Based on this research question, two main hypotheses were formulated. The first research question addresses the issue of how exposure to a marketing campaign increases visual attention to private label products. The second research question suggests that an informed awareness of the private label brand, through information about its name, products, features, and target audience, will improve consumer interaction frequency and the probability of the brand being noticed. Studies employing eye-tracking in stores, such as Wedel & Pieters (2008) and Chandon et al. (2009), illustrate that visual engagement and shelf display characteristics influence consumer gaze and interest patterns. Supporting these observations, Gidlöf et al. (2013) demonstrate that product information and previous experience with a product influence how consumers examine and prefer to purchase products. Collectively, these findings provide a solid theoretical framework for examining how marketing strategies can manipulate visual engagement and behavioral responses toward private label products.

Literature review

Research on consumer behavior increasingly emphasizes the role of visual attention in shaping purchase decisions, particularly in environments where many products compete for attention. Visual attention is an important characteristic for understanding shopping behavior because it indicates both where consumers direct their gaze and also the level of engagement with and towards particular products. As such, eye-tracking technology is now a key tool for studying these processes, since it enables researchers to record fixations, saccades, and overall gaze patterns as they happen. This methodology has been applied in real world retail settings, demonstrating that engagement and interest towards products is correlated with consumer gaze metrics (Agost & Bayarri-Porcar, 2024; Nordfält & Ahlbom, 2024).

As a result, eye-tracking technology has become a valuable research method for studying the process of visual attention during shopping experiences. Eye tracking technology enables researchers to measure fixation, saccadic movement, and total gaze pattern in real-time. This methodology has been implemented in actual retail store environments and demonstrates that there exists a relationship between the level of interest and engagement with products and the gaze metrics recorded by eye tracking technologies (Agost & Bayarri-Porcar, 2024; Nordfält & Ahlbom, 2024). In the area of retail marketing, researchers have shown that product placement, shelf arrangement, and informational cues all affect the way consumers allocate their visual attention. For instance, several studies have illustrated that shelf placement and organization along with explicit labels can influence where consumers direct their visual attention and ultimately lead them to specific products. In turn, increased visibility and interaction with products occurs (Chandon et al., 2007). Neuromarketing research has expanded upon this understanding by demonstrating that visual attention is not only affected by visual factors, but also by the cognitive engagement of the consumer. Moreover, eye tracking technology provides valuable data regarding which products capture the most visual attention of consumers, how long consumers maintain their visual attention on each product, and the pattern of visual attention throughout various sections of a retail environment. Data generated by eye tracking technology can therefore assist in developing better strategies to enhance consumer journeys and optimize retail results. Research indicates that greater levels of consumer interaction with and interest in certain categories of products (e.g., luxury cosmetics) may be achieved through the implementation of visual story-telling, colorful cues, visually appealing imagery, and detailed product information (Gaikwad & Sawant, 2025; Hurley et al., 2013).

Although eye tracking technology offers many benefits for researching consumer behavior in competitive retail environments, very little research has been conducted on private label products in visually rich retail environments such as fashion and beauty stores. The majority of studies conducted thus far have concentrated on general consumer products. Therefore, there are still unanswered questions regarding whether or not visual attention and engagement develop similarly for private label products when consumers are exposed to marketing campaigns or product information. There is also very little research that integrates eye-tracking data with video analysis to examine temporal and spatial aspects of consumer behavior (e.g., dwell time and revisits), both of which provide evidence of consumer engagement (Agost & Bayarri-Porcar, 2024; Kongmanon & Petison, 2022). The majority of present day studies examine simple gaze metrics (e.g., number of fixations, duration of fixations), few studies utilize multimodal approaches that combine fixation duration, saccadic patterns, and spatial consistency into a composite interest score. A composite interest score would provide a more complete representation of consumer attention and engagement during their shopping experience. The current study expands upon existing research by examining how neuromarketing and informed brand awareness affect consumer attention toward private label products in fashion and beauty retail environments. By addressing these knowledge gaps, the current study will contribute to both theoretical knowledge and practical applications of eye-tracking and neuromarketing research in visually rich retail contexts where private label offerings compete with established brands. We propose an interest score that combines fixation-to-saccade ratios, average fixation duration, inverse saccade duration, and fixation dispersion to create a continuous measure of visual engagement using eye tracking data and first-person video analysis.

The current study also demonstrates how utilizing objective gaze data to shape marketing strategies can increase customer engagement and visual attention, thereby providing insight into methods to increase the level of awareness and interest in private label items. This study will serve

as a foundation for future analyses of consumer attention and in-store behavior, thereby establishing a basis for understanding how branding and information impact the consumer journey in retail settings.

Methodology

This study utilized a combination of qualitative and quantitative methods using a pre-post experimental design to assess the effect of a marketing campaign on consumer's attention towards private label products within a physical retail environment. The experiment took place in a single location that is part of one of Romania's largest fashion/beauty retailers. In addition to testing two primary hypotheses based on previous research regarding private label branding and consumer behaviors, the study also examined whether "awareness" (i.e., information about the private label brand including its name, product line, key features/benefits, and target demographic) will increase the frequency at which consumers interact with the private label brand and therefore have a greater likelihood of having their interactions observed. Both of these hypotheses are supported by earlier studies using mobile eye tracking technology in retail environments. For example, Wedel & Pieters (2008), and Chandon et al. (2009) have demonstrated that individuals visually attend to shelves/display areas when shopping. In addition, Gidlöf et al. (2013) found that the amount of information available to shoppers about a given product influenced their gaze behaviors while they shopped. Like the aforementioned studies, our study employed mobile eye tracking glasses to record individuals' natural shopping patterns; however, our study applied this methodology to private label products after a marketing campaign in beauty/fashion retail environment. There were eight participants aged 18-24, each of whom had varying levels of familiarity with the retail store.

The experimental procedure consisted of two stages: firstly, the baseline phase where participants entered the retail store as though they were regular shoppers. They were allowed to explore the store at their leisure and engage with the products without any prior knowledge or influence. In the second stage, the post-information phase, prior to entering the retail store for a second time, participants were given information about the private label brand. Following the delivery of this information, participants re-entered the retail store and resumed their natural shopping habits. Participants signed written informed consents before participating in the study. All participant videos were anonymized through blurring out all other customers, and processing was completed using Python 3.12. The full experimental design is presented in Figure 1



Figure 1. Study design

Source: Authors' own contribution.

Quantitative Methods: Eye-Tracking Analysis

The quantitative data were obtained through mobile eye tracking, specifically, using the Viewpointssystem VPS19 eye tracker shown in Figure 2, which allows us to collect gaze data at 60 samples/sec along with synchronized video. The aim was to objectively determine whether or not

people were viewing an object, and we wanted to determine how much interest they had in that object by creating a composite interest score.



Figure 2. Viewpoint system VPS19 mobile eye-tracker

Source: <https://imotions.com/products/hardware/vps-19/>.

First, we derived the velocity of the gaze from the raw angular speeds obtained from the gaze file data generated by the mobile eye tracker. We converted the raw angular speed data into a continuous binocular velocity signal that can be directly used as input to an I-VT (Velocity Threshold Identification) algorithm to categorize fixations and saccades. In order to create a stable estimation of overall gaze velocity data, created a composite velocity signal by taking the average of the two velocity signals. Creating a composite signal helps eliminate noise specific to each eye and ensures continuity even if one of the eyes loses track for a short time. Gaze recordings frequently contain either zero values or missing values due to blinks or short-term loss of tracking. To develop a continuous velocity signal suitable for threshold-based categorization, we applied Piecewise Cubic Hermite Interpolating Polynomials (PCHIP) to interpolate between the valid portions of the composite signal. As demonstrated by Dan et al. (2020), PCHIP provides superior accuracy in preserving monotonicity and reducing overshoot in physiological eye-movement signals relative to linear or spline methods. PCHIP interpolation is monotonic and preserves shape. It maintains the local path of the data without producing overshoot. As such, it is an ideal tool for recreating natural eye-movement velocity signals. The resultant signal is a smooth, continuous angular speed signal that reflects continuous gaze movement dynamics throughout the entire recording. The interpolated velocity signal was scaled by the sampling rate (60 samples per second) to produce angular velocity in degrees per second, the standard unit for angular velocity in eye-movement studies. After producing a continuous gaze velocity signal, we utilized this signal as input to an I-VT (Velocity Threshold Identification) filter for categorization of eye movement events based upon the guidelines established by Olsen (2012) and Salvucci & Goldberg (2000), along with standard values. Within the I-VT framework, we compared each velocity sample with a velocity threshold of 30 degrees per second. Samples that fell beneath this threshold for at least 60 ms were categorized as fixations. If the samples were above the 30 degrees per second threshold, they were categorized as saccades. We extracted several gaze behavior parameters for each 1 second interval (60 samples) from these categorized events including the number and duration of fixations, fixation dispersion, and corresponding saccade characteristics. The extraction of these parameters enables reliable analysis of dynamic gaze behaviors (Holmqvist et al., 2011). Of these parameters, we used four normalized parameters to create the proposed interest score: fixation-to-saccade ratio, average fixation duration, inverse of average saccade duration, and fixation dispersion. These parameters together characterize the temporal stability and attentional focus of gaze behavior. For example, longer, more stable fixations and higher fixation-to-saccade ratios generally signify increased visual engagement. The selection of these parameters is consistent with well-established principles of eye-movement research where each parameter is representative of a separate component of visual attention (Skaramagkas et al., 2021; Pauszek, 2023; Negi & Mitra, 2020). The fixation-to-saccade ratio represents the trade-off between stable attention and

exploratory movement. Higher ratios generally signify increased cognitive processing and interest in the stimulus (Pauszek, 2023; Skaramagkas et al., 2021). The average fixation duration represents how long attention is directed toward a particular region. Longer fixations are commonly associated with information processing, comprehension, and engagement (Negi & Mitra, 2020). The inverse of saccade duration reflects the efficiency and frequency of gaze shifts. Shorter, more frequent saccades typically indicate active exploration within a region of interest rather than disengagement (Pauszek, 2023). Fixation dispersion, which quantifies the spatial consistency of gaze within fixations, represents the concentration of attention. Lower dispersion generally correlates with focused attention, while higher dispersion signifies diffuse or shifting interest (Mahanama et al., 2022). By combining temporal, spatial, and dynamic elements of gaze behavior, the proposed compound interest score provides a continuous and interpretable measure of visual engagement. Compound or multivariate indices are supported over single metrics by recent methodological work because compound indices capture multiple aspects of visual behavior and therefore increase robustness in modeling attention and engagement (Skaramagkas et al., 2021). This integrative approach is consistent with recommendations for combining multiple eye-metrics to model attention and interest (Skaramagkas et al., 2021; Pauszek 2023). An example of the interest score calculated for a single recording is illustrated in Figure 3.

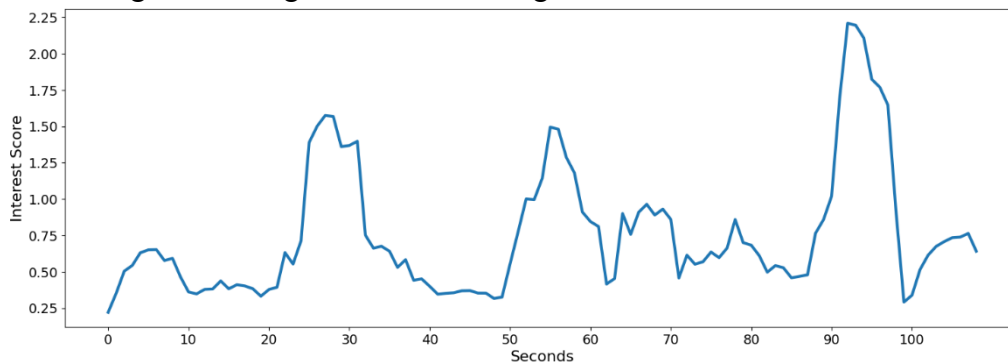


Figure 3. Interest score evolution in one recording

Source: Authors' own contribution.

The interest score shown in the figure represents how the participants' visual engagement changed throughout the store experience. The interest scores varied across time with several clear peaks in the score representing times when the participants were more visually attentive and engaged. These peaks are representative of times when the participants had higher interest or were exposed to something that was personally meaningful. On the other hand, the periods of lower interest represented by the valleys in the score represent times when there was less stimulating visual input from the stores. Overall, this shows that attention during the store experience was not consistent but varied based on the type of visual stimuli present at any given moment. This type of variation in attention/interest is typical of what we see in everyday viewing situations where attention/interest varies dynamically instead of consistently. In this study we found that all participants together averaged about 3 visually engaging products during each store visit. The initial store experience showed participants having an average of 3.38 peaks (SD = 1.06) in their interest scores.

The post-information experience showed participants averaging 3.25 peaks (SD = 1.28) in their interest scores. Both of these averages were tested against normality using Shapiro-Wilk tests and neither distribution was significantly different than normal (pre-information $p=0.69$; post-

information $p=0.81$). Therefore, a paired t-test was conducted and there was no significant difference in the number of visually engaging products between stages ($p=0.15 > 0.05$). This suggests that providing participants with information about the private-label brand did not significantly affect the number of products that caught the participants' visual attention. Participants typically focused on approximately three products per store visit regardless of whether brand information was available.

Quantitative Methods: Video Analysis

The second quantitative method used in this study was video analysis. Each participant's store experience was recorded using the VPS19 mobile eye tracker. The VPS19 records a first-person video and synchronizes this video with gaze-point data and by exporting this video will produce a gaze indicator, which is a small circle placed on top of the video frame that represents the participant's current focus point in real-time. By integrating both video and gaze data, we were able to conduct a detailed analysis of visual attention and behavioral patterns in the store environment on a frame-by-frame basis. An example frame from the VPS19 output is illustrated in Figure 4.



Figure 4. Video frame from VPS19

Source: Authors' own contribution.

As a first step, we measured the amount of time participants spent in the store by recording the time they entered and exited. The mean visit time to the store during the pre-information phase was 132.29 seconds with a standard deviation (SD) of 23.60. During the post-information phase, the mean visit time to the store was 121.29 seconds with a SD of 27.55. We conducted Shapiro-Wilk tests of normality to confirm that both pre- and post-information store visit times were approximately normally distributed (p -value for pre-information = 0.670, p -value for post-information = 0.460). A paired t-test was then used to compare the pre- and post-information conditions. There was no statistically significant difference between the two conditions (p -value = 0.318 > 0.05). Therefore, providing information about the private label brand did not appear to affect the length of time participants spent browsing in the store. Combined with our eye tracking results, these findings suggest that participants maintained similar levels of engagement and exploration behaviors across both visits.

In addition to analyzing the overall store visit duration, we also used synchronized video and gaze data to identify when and where interest peaks occurred in the store. Each interest peak was matched to its corresponding video frame to identify what product or area caught participants' attention. All of these peak points were combined to create an interest-interaction map that

illustrated the most compelling areas of the store. Furthermore, two related behavioral indicators were developed to provide additional insight into participants' behavior while shopping: the revisit rate, which measures how frequently participants looked back at previously identified areas of interest; and the predominant interaction time or dwell time, which represents the total amount of time participants continuously viewed a single product. Dwell times are an indicator of sustained attention and due to the rapid-changing nature of the in-store environment and variability in individual exposure times, interaction measures were normalized using a relative ranking method. The relative ranking method allows researchers to compare engagement across participants and between pre- and post-information sessions by comparing the proportion of participants who interacted with each product or area, as opposed to counting the absolute number of interactions with each product or area. Normalization methods enable researchers to determine whether certain products consistently drew attention despite variations in individual behavior patterns.

Qualitative Methods: Self-assessment questionnaire

In order to supplement our quantitative analyses, participants filled out a self-assessment questionnaire consisting of four Likert scale questions regarding their familiarity, perceived quality, purchase intent, and comparison with other brands. Participants completed the questionnaire twice during each experiment session, once during the benchmark phase and again during the post-information phase. The purpose of this questionnaire was to allow us to examine whether participants' perceptions changed after they received information about the private label brand. The questions and corresponding rating scales are shown in Table 1.

Table 1. Self-assessment questionnaire items and response scales used in the benchmark and post-information stages

Item	Question	Scale	Measurement Focus
1	How familiar are you with the brand's store?	1 (very limited familiarity) – 7 (very familiar)	Brand familiarity
2	How would you rate the perceived quality of the private-label brand?	1 (very low) – 5 (very high)	Perceived quality
3	How likely are you to buy a private-label brand product?	1 (not likely at all) – 5 (very likely)	Purchase intention
4	How would you compare the private-label brand to well-established brands?	1 (much worse) – 5 (much better)	Brand comparison

Source: Authors' own research

The first question, "How familiar are you with the brand's store?" was asked during the benchmark stage to measure participant initial familiarity. Participants reported an average of "moderate" when asked about their familiarity with the stores of this brand. The distribution of responses is displayed in the histogram in Figure 5. A Shapiro-Wilk test indicated that the data were approximately normally distributed ($p = 0.6898 > 0.05$).

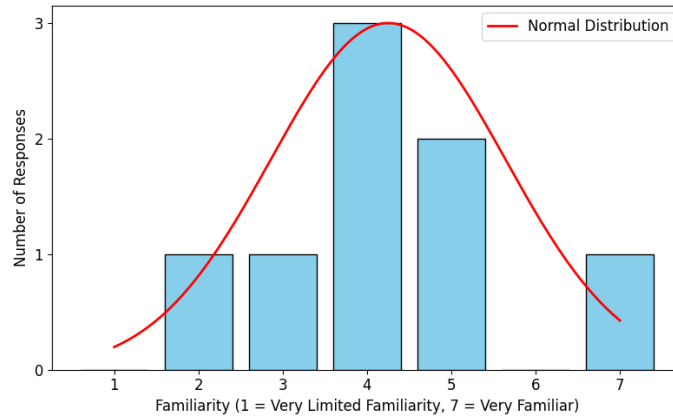


Figure 5. Distribution of participants' familiarity with the store

Source: Authors' own contribution.

The remaining items of the questionnaire, including perceived quality of the private-label brand, purchasing intent, and comparison to well-established brands, were assessed in both the benchmark and post-information stages. Boxplots of the responses are shown in Figure 6. The visualizations suggest a general increase in median scores from the benchmark to the post-information stage, indicating that providing information about the private-label products heightened participants' attention and interest. These results complement the eye-tracking findings by showing that informed awareness not only guided where participants looked in the store but also increased their engagement and consideration of the private-label products.

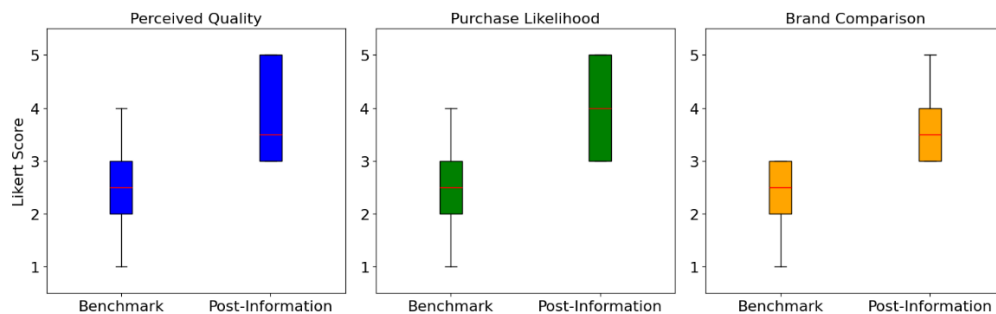


Figure 6. Self-assessment responses before and after private-label brand information

Source: Authors' own contribution.

Results and discussions

In this section we present the results obtained from the combined eye-tracking and video analysis of our experiment. The figure below (Figure 7) illustrates the interaction map of the store during the initial phase of the study, which includes three different aspects; the primary focus of attention (A), the amount of time spent interacting predominantly with certain elements (B), and the number of times that visitors re-visited the same element(s) (C). In addition, the area within the store where private-label products are displayed is highlighted in red rectangle.

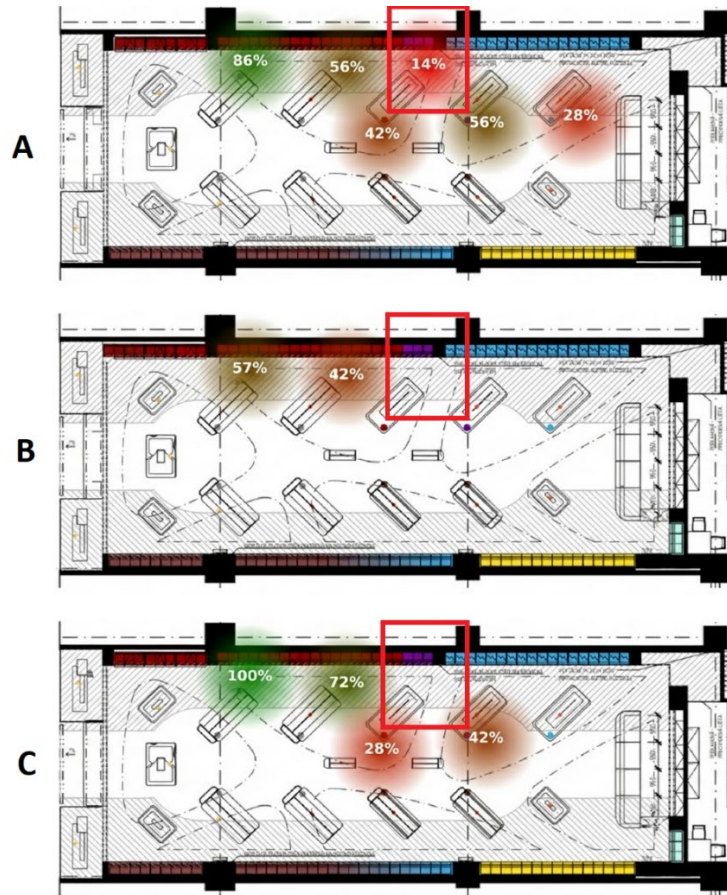


Figure 7. Interaction map of the store layout during benchmark stage

Source: Authors' own contribution.

Panel A illustrates the general interaction pattern across the store. It was found that 86% of the participants interacted with the luxury brands area; this indicates a high degree of interest in this category of products. A medium level of interaction (between 28% and 56%) was recorded in the vicinity of the product islands located alongside the main aisle. Additionally, there was a moderately sustained level of interaction by 56% of participants with the area directly adjacent to the luxury brands area. In contrast, the private-label area recorded only 14% interaction, implying that it was not able to attract the attention of the participants. One explanation for the low rate of interaction with the private-label area may be due to its close proximity to the luxury brands area; therefore, participants may have focused their visual attention elsewhere.

Panel B captures the cumulative dwell time, representing the predominant interaction duration. Here, participants spent the greatest portion of their time in or near the luxury brands area; 57% were located within the luxury brands area, and an additional 42% were located immediately adjacent to it. As such, participants not only noticed the luxury brands area, but also spent more time there than in any other area of the store. The longer dwell times indicate that the luxury brands displays were more appealing and visually stimulating to the consumers, and therefore more effective in retaining consumer interest than other areas.

Panel C represents the frequency at which participants revisit each area and how frequently their attention shifts back to each area. All of the participants revisited the luxury brands area and its surrounding environment, as well as several locations along the main aisle. However, none of

the participants revisited the private-label area, even though it was located directly adjacent to areas of high interest. The revisit heatmap provides further support for the conclusion that the luxury brands area served as the primary focus of participants' visual attention and behavior while shopping in the store. Therefore, the private-label area went largely unnoticed by participants. The results of the benchmark stage demonstrate that the luxury brands area consistently attracted the greatest amount of participant attention and interest across all three metrics. Conversely, the private-label area generated very little participant engagement and interest. The lack of participant interaction with the private-label area appears to be directly related to the placement of the private-label products beside the luxury brands area.

Luxury brands have a competitive advantage over private-label brands because they typically possess significantly greater brand recognition and receive far more publicity through various forms of media. In addition to providing insight into optimal product placement strategies and possible store layout modifications to enhance participant engagement and interaction with private-label brands, these results also reveal that without intentional efforts to market private-label brands to consumers, participant interaction with private-label products will likely remain minimal. The above statement justifies why we chose to conduct the second phase of our study, specifically, we will now examine whether providing consumers with information about private-label brands will influence their interest in, interaction with, and overall awareness of private-label brands.

The second phase of our study occurred after participants were provided with information regarding the store's private-label brands. The interaction map depicting participants' interactions during the second phase of our study is depicted in Figure 8.

As indicated by Panel A, there was a substantial increase in participant interaction with the private-label area from 14% in Phase I to 57% in Phase II after participants received information about private-label brands. The 43% increase suggests that awareness and knowledge about private-label brands positively influenced participants' initial visual engagement. The increased attention appears to have been derived primarily from the main aisle area, which had previously demonstrated moderate engagement. Participant interactions with the luxury brands area (86%) and the adjacent zone (56%) remained relatively consistent, suggesting that participants continued to maintain high levels of visual engagement with those areas even after being informed about private-label brands. The combination of increased engagement with private-label brands while maintaining similar levels of visual engagement with luxury brands indicates that participants did not redirect their visual attention from high-interest areas but rather became increasingly receptive to exploring private-label brands after learning about them.

Panel B, representing dwell time, illustrates a further change in participant behavior. Time spent by participants within the private-label area increased to 42%, while the amount of time spent in both the luxury brand area and the adjacent areas decreased significantly from 57% and 43% respectively to 28% each. The increase in the amount of time participants chose to spend evaluating the private-label products indicates that participants were not simply taking notice of the products but rather spending additional time to evaluate their features and benefits, therefore indicating an increased level of interest. Also, the decrease in participant uncertainty and increased perception of the brand identity associated with the private label resulting from the new information provided may have contributed to a more equally distributed visual engagement across all product zone types.

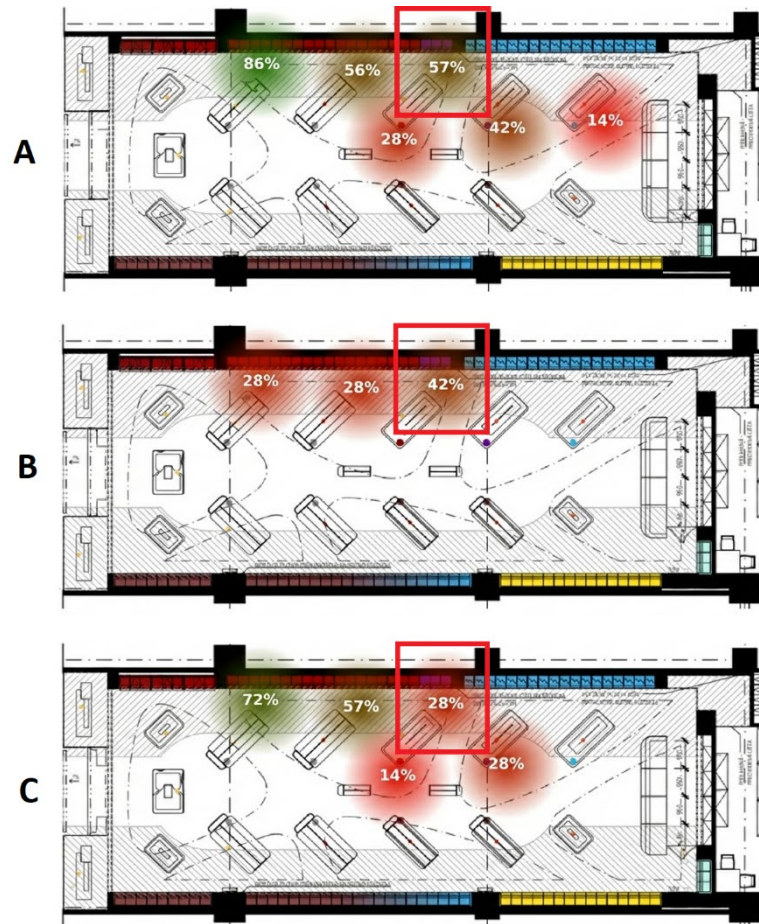


Figure 8. Interaction map of the store layout during post-information stage

Source: Authors' own contribution.

Panel C provides evidence of the revisiting behavior of participants; it supports the general positive trend. Approximately 28% of participants returned to the private-label area during the study period. In contrast, there were zero revisits recorded during the benchmark period so the interpretation of the revisit behavior is one of interest, curiosity, and/or comparative evaluation. The occurrence of revisits indicates that the private-label section moved from a position of periphery relevance to moderate relevance in the consumer journey. Also, the revisiting pattern in the second stage could be indicative of increased curiosity and exploratory approaches by consumers after having received information regarding private-label products.

Overall, the second phase demonstrated a significant shift in the ways consumers viewed and interacted with the store environment. Specifically, after consumers had been provided with information regarding the store's private-label brand, the consumer interaction with the private-label product area increased in each of the three key measures: initial focus on the area, total time spent in the area, and number of revisits to the area. Therefore, these results reinforce the concept that informing consumers about a particular brand may affect the consumer's path through and behavior within the retail setting. Although the luxury brand area continued to draw considerable consumer interest, this was likely due to the luxury brand's strong image and well-established marketing efforts. These results are consistent with both of the hypotheses tested. The first hypothesis, that a marketing campaign will increase visual attention toward private-label products,

was supported by the increases in interaction (43%), dwell time (42%), and revisit rates (28%) following provision of brand information to participants. The second hypothesis, that an informed awareness of the private-label brand would improve interactions and opportunities for recognition, was also supported. Participants not only interacted with the private-label area more frequently than before receiving brand information; they also spent greater periods of time examining the area and revisited it more frequently. In summary, our study indicates that even brand information can result in an increase in visibility and interaction with private-label products.

Conclusion

The present study demonstrates that providing information to consumers regarding private-label products increases their attention and engagement in a retail environment. Using mobile eye tracking and video analysis techniques to measure fixation patterns, dwell time and revisits (patterns of fixations occurring after an initial fixation) to assess visual engagement. Prior to receiving product information, participant's exhibited minimal interest in private-label products; however, following receipt of information pertaining to the brand, product characteristics and target market segment, engagement increased and included increased initial focus on the private-label product(s), longer dwell time(s) on the private-label product(s) and instances of revisiting the private-label product(s). These findings indicate that providing consumers with information about private-label products will increase both the visibility and relevance of private-label products. Furthermore, the present study demonstrates that combining eye tracking and video analysis methods provides valuable insight into consumer behavior in actual retail environments. These types of studies can be conducted by marketing departments to evaluate strategic approaches, store layout designs or alternative interventions designed to enhance engagement with products. Although there are several limitations associated with the present study, they include only eight participants involved in the pilot study, only conducting the study in one retail location, only using participants who are young adults aged 18-24, only utilizing data collected from participants within the specified age range, and only analyzing data collected from one specific retail location. Also, additional research will need to be conducted to determine whether the findings of the present study apply to larger numbers of participants, in multiple retail locations, and/or across different categories of products.

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